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ABSTRACT

This study is based on a survey of a sample of 162 academic libraries holding between 90,000 and 500,000 volumes. The report begins by comparing various characteristics of the libraries to arrive at a profile of an average sample library in terms of volumes, enrollment, volumes per student, budget, expenditures per student, salaries as percent of total budget, periodicals as percent of book budget, and expenditures for databases and cooperative activities. The first of two main parts of the survey form focused on computer-based services; mainframe/minicomputer applications; microcomputer applications for library databases, CD-ROM, library administrative functions, and patron laboratories; software collections; and other applications (chiefly printers and modems). The second part dealt with problems and coping strategies in the seven application areas. The responses indicated that: (1) nearly all of the libraries participated in a bibliographic utility and an online database service; (2) other computer-based services--i.e., acquisitions, serials, COM catalogs, and CD-ROM catalogs--were much less used; (3) less than one-half were involved in the operation of locally based automated systems, including online catalogs and circulation systems; (4) 19 major systems were represented among the respondents, with five being the highest number of users for any single system; (5) microcomputer (PC) applications for acquisitions and serials control were more common than for cataloging and circulation; (6) PC use for word processing and spreadsheets was reported by more than one-half of the respondents, with fewer libraries using desktop publishing and graphics programs; (7) more than half reported computer laboratories for patrons; (8) the number of software programs varied widely for different microcomputers; and (9) printers and modems were more readily available for staff than for patrons. Problems listed were (in rank order) in the following areas: financial, facilities, staff, patrons, and vendors. The top three coping strategies were "shifted budget," "workshops," and "networking," and the lowest ranked was "consultants." Others listed included journals, vendor training, cooperative arrangements, documentation, additional staff, patron training, and added budget. A copy of the survey instrument is appended. (DB)

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Computer Applications and Libraries

A Study of Small and Medium-sized Academic Libraries

Spring, 1991

A Research Project
by
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COMPUTER APPLICATIONS AND LIBRARIES

This study is based on a sample of 162 academic libraries holding between 90,000 and 500,000 volumes selected from listings in the 21st edition of the College Blue Book: Tabular Data. The total number of libraries listed which met the criterion was 714. The size characteristic parallels that of Cooperating Libraries in Consortium (CLIC), a consortium of eight chiefly academic libraries in St. Paul, Minnesota, of which the researcher's library is a member. The first academic library in each state as well as each succeeding fifth library listed which met the holdings criteria was included in the survey. If no library in the state met the criterion, the library closest in size was selected. Responses were received from 100 libraries.

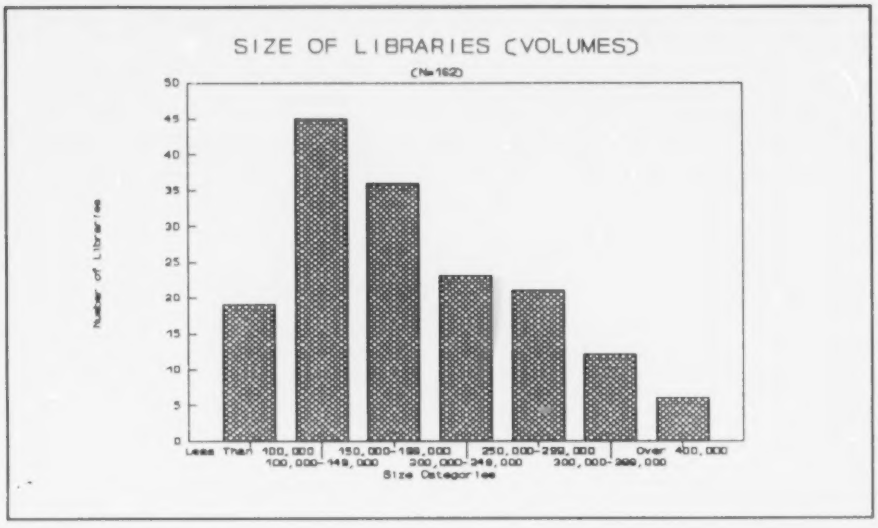
Characteristics of the Sample Libraries

The 162 libraries in the sample were checked in the American Library Directory, 1990-91 edition, to verify the chief librarian, addresses, and telephone numbers. At the same time, new and updated data was gathered for each library dealing with size, enrollment, total budget, and expenditures for salaries, books, periodicals, databases and cooperative activities. Data was then extrapolated for volumes per student, expenditures per student, expenditures for salaries as percent of total budget, expenditures for periodicals as percent of book budget, and expenditures for databases and cooperative activites as percent of total budget.

Size of the Libraries (Volumes)

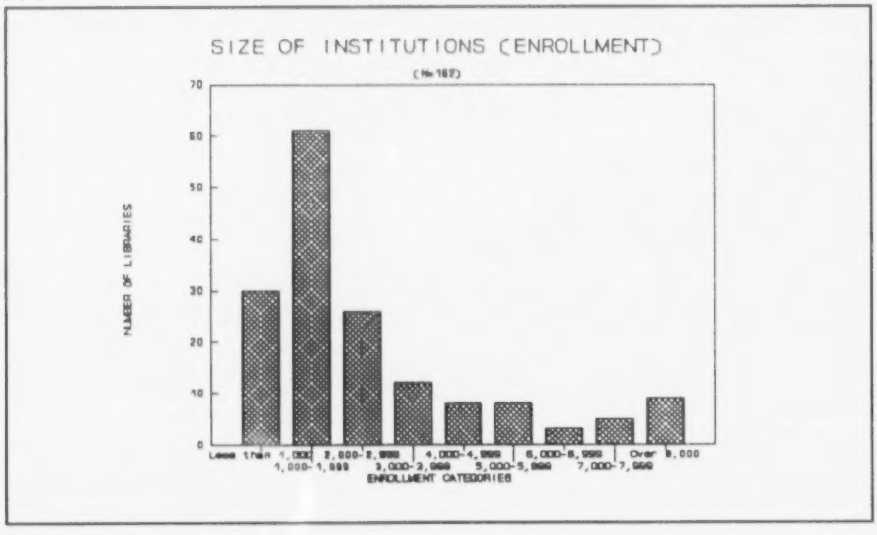
The size of the library was the basic criterion used to select libraries for the sample after the geographical area was identified. Although the College Blue Book was the tool used in the selection process, holdings were updated to reflect data reported to the American Library Directory. Bound periodicals were included in the volume count.

The average library size was 193,569 volumes for the total sample of libraries. For the 100 libraries from which returns were received, the average size was 184,901. Only one of the six libraries holding over 400,000 volumes responded. Only nine of the 19 libraries under 100,000 volumes responded. Only two of these held less than 90,000 volumes. The respondents, therefore, with three exceptions, consisted of libraries holding between 90,000 and 400,000 volumes.



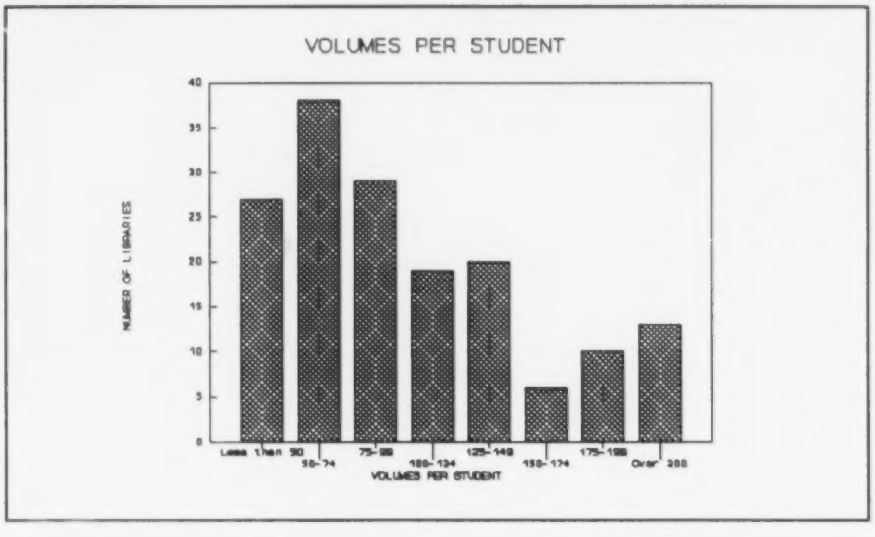
Size of the Institutions (Enrollment)

Enrollment data was obtained for all 162 institutions whose libraries were in the sample. Again, the more recent data in the American Library Directory was used, if reported. The average enrollment was 2,687. Only 11 of the 25 institutions enrolling over 5,000 students responded. Two of six libraries, whose institutions enrolled less than 500, responded. In summary, 87% of the repondents were from institutions with enrollments between 500 and 5,000.



Volumes Per Student

The average number of volumes the libraries in the sample held per student was 72. The range was from 17 to 626. The library holding 626 volumes per student, which, incidentally, was not a respondent, was an anomaly. The next largest holder of volumes per student held 318; Succeeding holdings decreased in increments of 5-17 volumes or less.

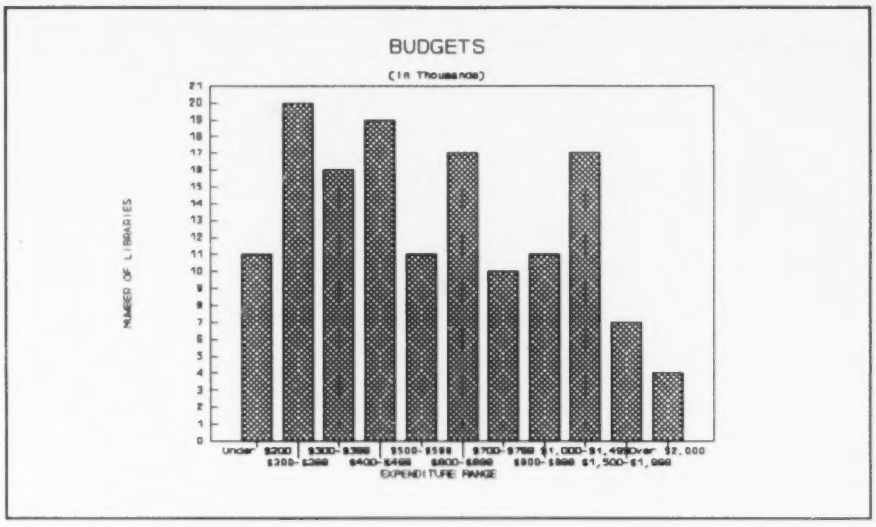


Of the 25 libraries holding the largest number of volumes per student: a) four are among the 25 largest collections, b) three are among the 25 smallest collections, and c) none are among the 25 largest enrollments.

Of the 25 libraries holding the smallest number of volumes per student: a) twelve are among the 25 largest collections, b) one is among the 25 smallest collections, and c) fifteen are among the 25 largest enrollments.

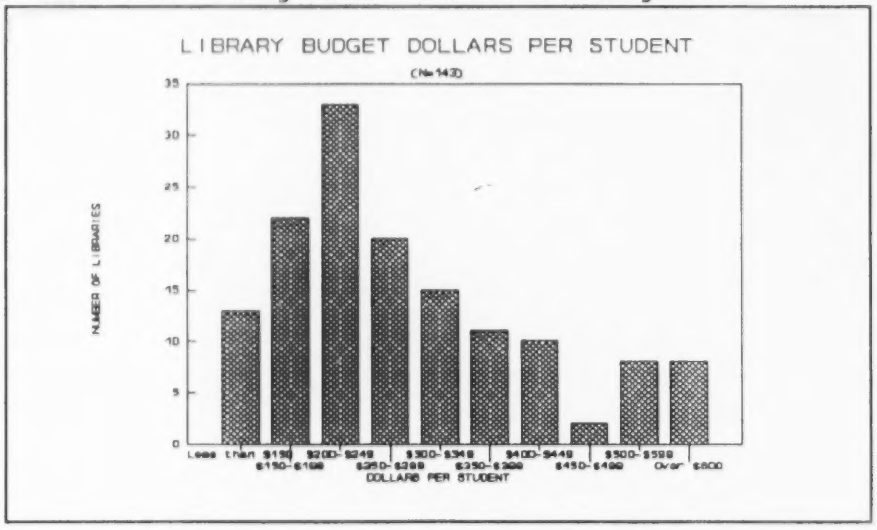
Budgets

The average budget for the 143 libraries for which data was reported was $692,776. Totals ranged from $71,400-$4,181,266. Four libraries had budgets in excess of $2,000,000.



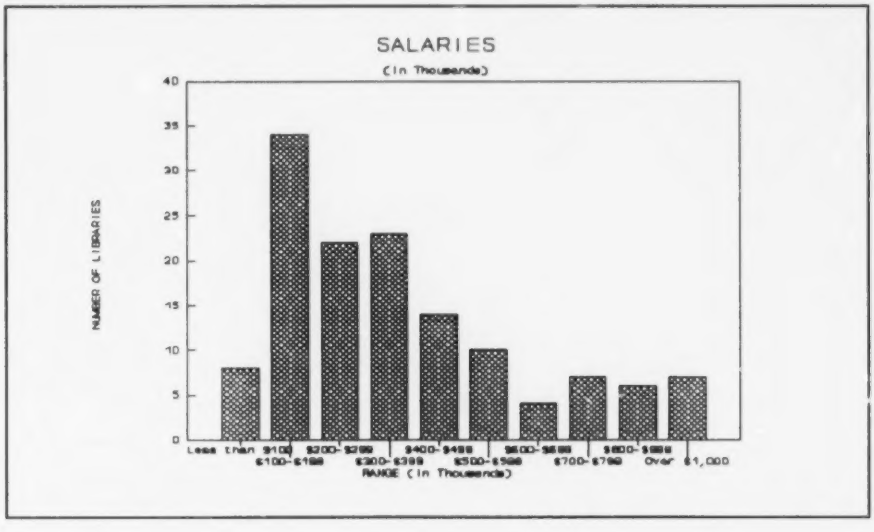
Expenditures Per Student

Data was available for 143 institutions. The average expenditure was $258 per student with a range of $59-$1,001. Of the 25 institutions expending the largest amounts per student, none were among those with the 25 largest enrollments; nine were among the 25 with the smallest enrollments; three were among the 25 largest budgets; none were among the 25 smallest budgets.



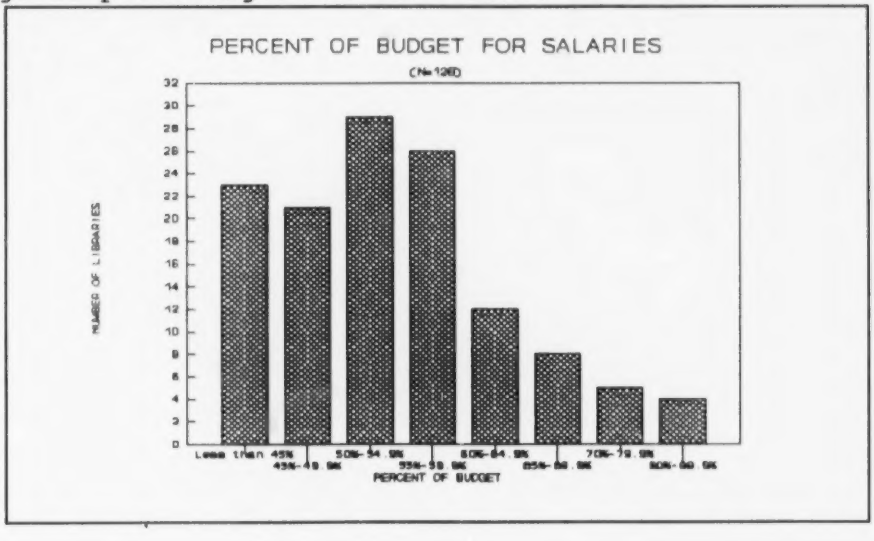
Expenditures for Salaries

Salary data was available for 134 libraries. The average amount spent for salaries was $395,949, ranging from $12,000-$2,108,709.



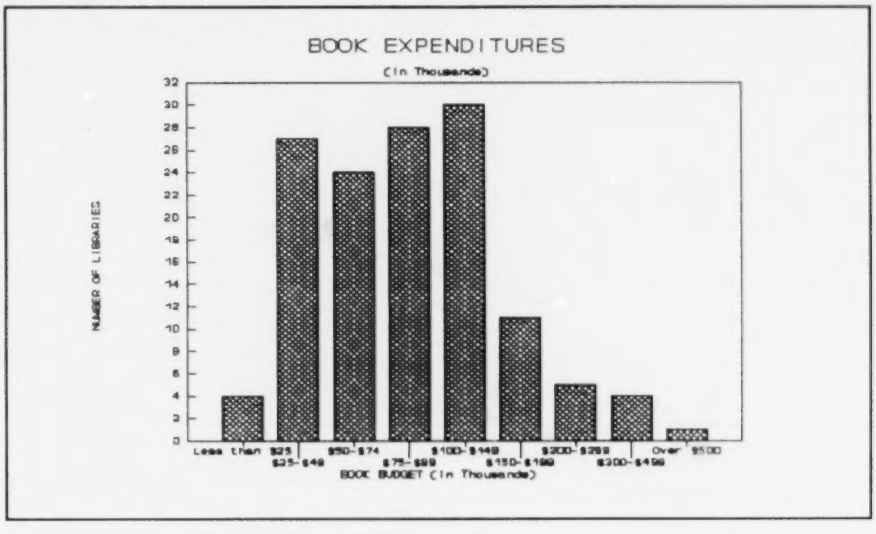
Percent of Budget for Salaries

Data on this characteristic was available for 128 libraries. The average percentage of the budget expended for salaries was 57.2%. The range of percentages was from 16.8% to 87.7%.



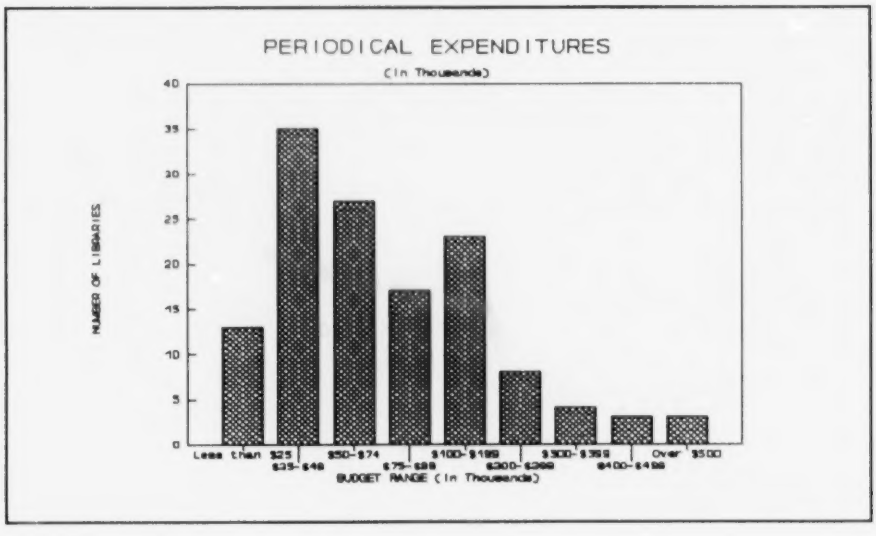
Expenditures for Books

With data from 134 libraries, the average expenditure was $101,106. Book expenditures ranged from $10,000 to $506,000.



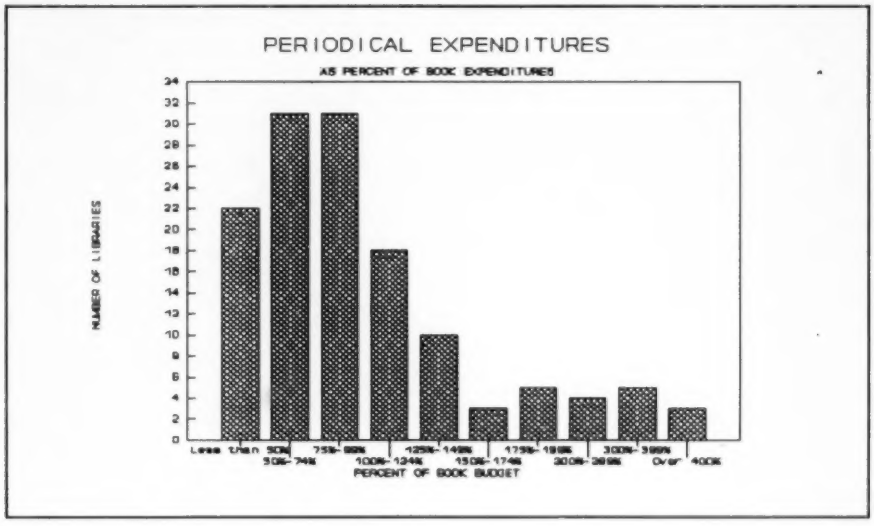
Expenditures for Periodicals

Data was available for 133 libraries. The average expenditure was $106,696, ranging from $9,100-$718,252.



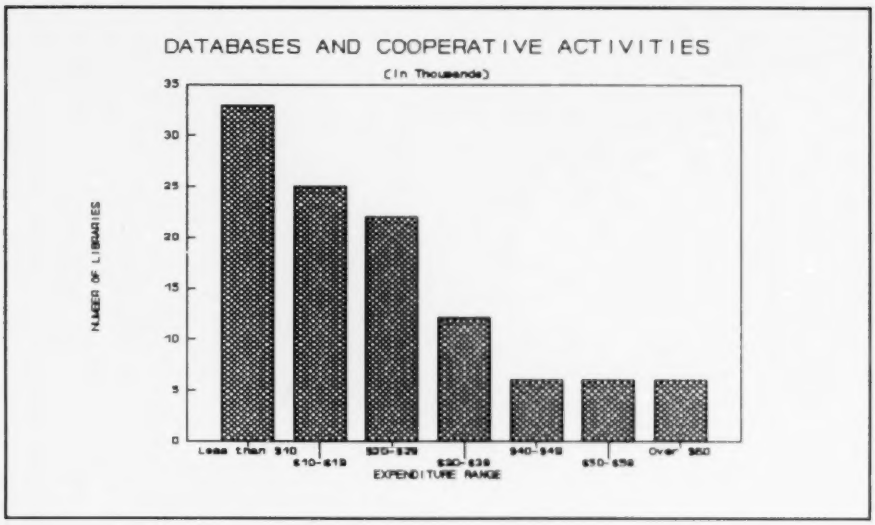
Periodical Expenditures as a Percentage of the Book Budget

Data was available from 132 libraries. The average percent of the book budget spent for periodicals was 105.5%, indicating, on the average, expenditures for periodicals slightly exceeded that for books. The range varied widely, however, beginning with 22.3% and reaching 507% in one instance. Although a majority, 64%, of the libraries spent more for books than for periodicals, twelve, or 9%, spent more than twice as much for periodicals than for books.



Expenditures for Both Databases and Cooperative Activities

Data was available from 110 libraries for these two categories. The categories were combined because both seemed to relate to automation and there seemed to be some lack of clarity in the interpretation of the categories. The range was from $100-$141,518, with an average of $23,675.



Average Sample Library

Noting selected characteristics from the preceding presentation, the following profile of a sample library can be described:

Volumes	193,569
Enrollment	2,687
Volumes Per Student	72
Budget	$642,776
Expenditures Per Student	$258
Salaries as % of Total Budget	57.2
Periodicals as % of Book Budget	105.5
Expenditures for Databases and Cooperative Activities. . .	$23,675

Characteristics of the Survey Instrument

The survey form was divided into two main parts. The first dealt with computer applications that had been made in the sample libraries. Questions were structured into the following seven categories:

A. Computer-based Services
B. Mainframe/Minicomputer Applications
C. PC Applications-Library Databases
D. PC Applications-CD-ROM
E. PC Applications-Library Administrative Functions
F. PC Applications-Patron Laboratories
G. Software Collections
H. Other Applications (Chiefly printers and modems)

The second part dealt with problems and coping strategies related to the seven application areas. Problems listed were financial, facilities, staff, patrons, and vendor. Coping strategies listed were workshops, journals, vendor training, consultants, networking, cooperations, documentation, added staff, patron training, added budget, and shifted budget. Of course, respondents were encouraged to identify problems and strategies not listed. Definitions were presented for each problem and strategy. Respondents were asked to rank each problem and strategy in relation to each of the seven application areas.

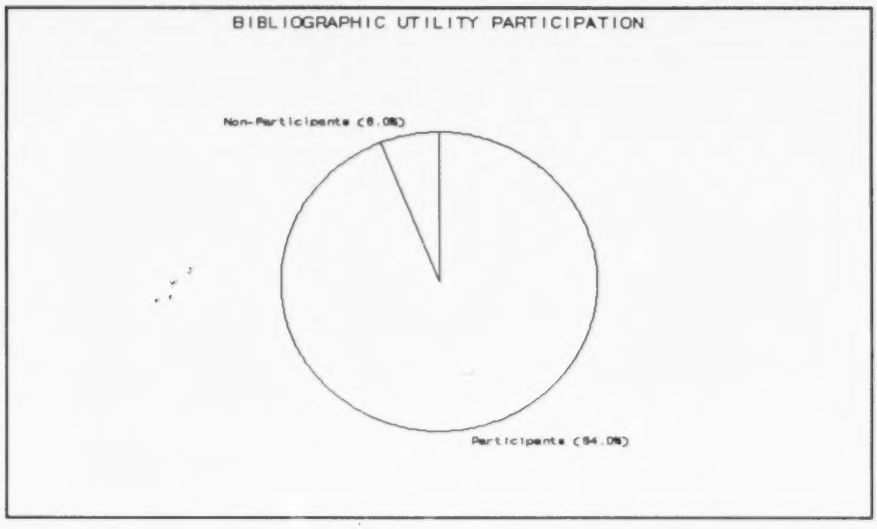
A Description of Computer Applications Being Made in the Sample Libraries

Computer-based Services

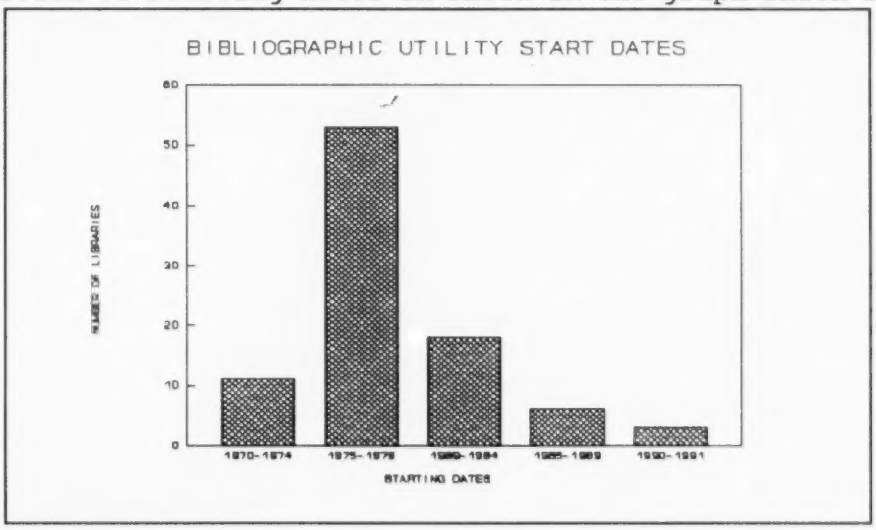
The first section requested information about computer-based services to which libraries usually subscribe for a fee. Examples would be OCLC for cataloging or BRS for database searching. Respondents were requested to give starting dates and the number of workstations providing access to the service. This section received the largest response rate in that nearly all of the libraries participated in a bibliographic utility and an online database service.

Bibliographic Utilities

Nearly all of the respondents participated in a bibliographic utility. Ninety-three utilized OCLC, two utilized WLN (one in New York and one in Idaho), and one utilized RLN (California). Four of the six non-participants were subscribers to an online database service such as Dialog. Therefore, only two libraries were without any major computerized service whatsoever. An average of 2.6 workstations were reported for cataloging.



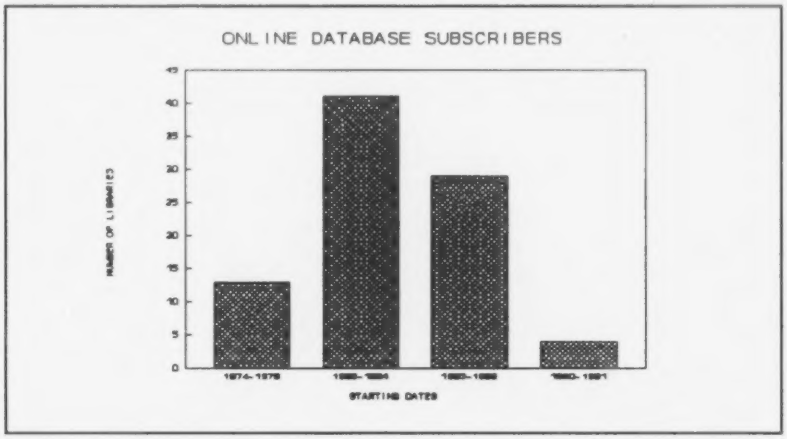
Over one-half of the participants began their utilization of a bibliographic utility during the 1975-1979 time period. The distribution of starting dates in shown in the graph which follows.



Online Databases

Nearly all of the respondents subscribed to online databases. A graph of subscribers would look very much like the graph of bibliographic utility participants except that the percentage of subscribers would be 92% instead of 94% since there were eight non-subscribers. Six of the eight non-subscribers did have OCLC available, however. An average of 1.4 work stations were reported for database searching.

The distribution of starting dates for utilization of online databases peaks about five years later than the bibliographic utility starting dates. The peak years were 1980-1984 and startup activity was still strong between 1985-1989. The following graph shows the pattern.



Of the online database services available, 86% of the respondents subscribed to Dialog. Forty-four reported Dialog as the only service they had available. BRS was reported by five libraries as the only service they had available. The chart below shows the various services reported.

ONLINE DATABASE SERVICES
(Number indicates libraries reporting)

Dialog	86
BRS	32
Wilson	17
Westlaw	3
EPIC	6
Other	11

Other Computer-Based Services

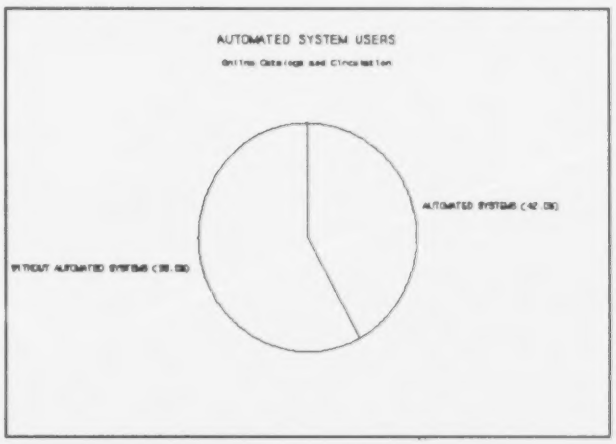
Other forms of service were much more limited among these libraries. Even some of the responses listed in this section were PC-based and not really a part of an online computer service. There is some ambiguity between this category, identified as "Computer-based Services" and a later section entitled "PC Applications--Library Databases." Microlinx and MATTS were put in the PC Applications category. OCLC was retained in this section. With that explanation, the following list shows the number of libraries utilizing each of the services indicated.

Service	No. of Libraries
Acquisitions	6
Serials	7
COM Catalog	4
CD ROM Catalog	15

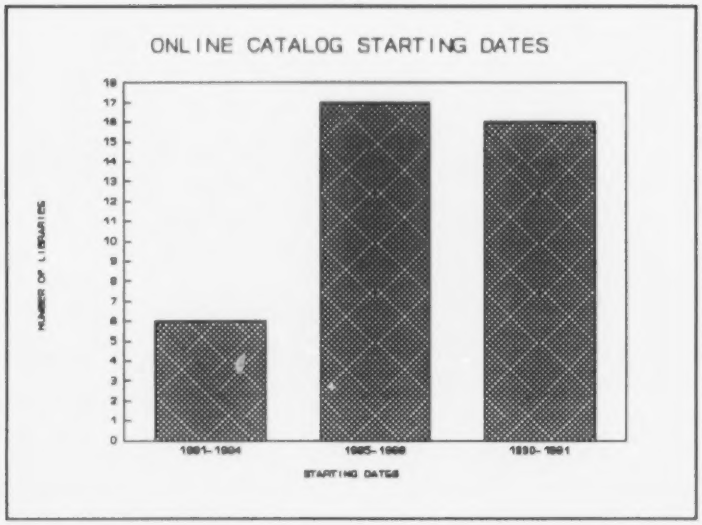
Mainframe/Minicomputer Applications

Online Catalogs, Circulation

Less than one-half of the respondents were involved in the operation of locally based automated systems. Forty-two percent had online catalogs and circulation systems. Twenty-one percent had acquisitions systems based on a local mainframe or minicomputer, and only one serials control system was reported in this category.



The following graph shows the starting dates for online catalogs. It is interesting to note that the larger number of starts in this group occurred during the 1985-1989 period, five years after the online database surge and ten years after the heaviest bibliographic utility participation. It should also be noted that the automated system involvement did not peak as dramatically and is still in progress at an apparently steady pace. Three respondents did not report starting dates.



The following schedule shows the major systems that were represented among the respondents. Although several systems are represented in five libraries, there is no indication of a predominance of one vendor.

SYSTEMS ADOPTED BY RESPONDENTS
() indicates number of systems reported, if more than one

AMERITECH (2)
BRS
CARL
CARLYLE
CLSI (5)
DRA (2)
DYNIX
GEAC
III
INLEX (2)
INNOVATIVE (3)
LCS (3)
MULTILIS
NOTIS (3)
OCLC/LS2000 (3)
SIRS (2)
UNISYS/PALS (5)
VTLS (4)
WASHINGTON STATE

PC Applications--Library Databases

The use of PCs for major library operations and databases in libraries of the size represented in this sample appeared limited for such activities as cataloging and circulation. Four respondents indicated they were using PCs for cataloging and eight made such reports for circulation.

In the acquisitions area such applications were more commonplace. Thirty-nine reported using B&T Link, MATTS, and other programs of that nature. Fourteen libraries reported using PCs for serials control.

PC Applications--CD ROM

Only 12 libraries did not report utilizing CD ROM stations. The remaining 88 libraries reported over 366 applications, an average of over four per library. The following chart shows the number of programs held by the libraries. Three libraries had more than 13 programs.

CD ROM PROGRAMS

No. of Programs	No. of Holding Libraries
1	88
2	72
3	56
4	44
5	30
6	20
7	16
8	10
9	8
10	7

Wilson and InfoTrac were the most commonly held indexes with about 70 holdings for each. Over 40 libraries reported having ERIC available.

PC Applications--Library Administrative Functions

Word processing on personal computers was reported by 86 libraries. The most common program was Word Perfect, used by 61 libraries. Six reported using Macintosh computers. Although one library reported using a word processing program as early as 1975, one-half of the users began since 1988.

There were 62 reported spreadsheet users. Lotus was used by 35 of these. Fifty-six reported using database programs. The programs used most were dBase, 18; PC File, 10; and Paradox, 9. Thirty-six

libraries reported using other programs, mostly desktop publishing and graphics programs. Utilization of PCs for database and spreadsheet programs follows the pattern of word processing usage--a small number of users in the early 1980s with most users beginning after 1988.

PC Applications--Patron Laboratories

Fifty-five, or slightly over one-half, of the libraries reported computer laboratories for patrons. Some were small, one or two computer facilities. The largest number of computers provided by one library was 80. Twenty-one of the libraries provided both IBM and Apple hardware.

Most Apple IIe installations occurred between 1983-1986. Most Macintoshes were installed in 1989-1990. IBM installations have occurred steadily since about 1984, with the heaviest years being 1987-1989. Counting each type of equipment as an installation, recognizing that more than one installation could be located in one laboratory, 90 installations were reported. The following chart describes their composition.

PERSONAL COMPUTER INSTALLATIONS

Type	No. Installations	No. Computers	No. on LAN
Apple IIe	18	107	10
Apple IIgs	6	7	0
Macintosh 512	13	105	99
Macintosh II	4	24	8
IBM	49	562	150
Totals	90	805	267

Thirteen of the installations were identified as being actively managed by the library. Twenty-four indicated the library was somewhat involved. Fourteen indicated no library involvement.

Software Collections

Sixteen libraries reported software holdings for Apple IIe computers. Only 12 of these had general software holdings other than word processing, database, and spreadsheet programs. They ranged in size from 1-1600. Not counting the 1600 item collection, the average size was 43 programs. With four or five exceptions, there were no software collections of any size for the Apple IIgs and Macintosh computers reported--just 1-5 copies of word processing, database, or spreadsheet programs.

Sixty libraries reported word processing software for the IBM, averaging two titles and seven copies each. Forty-six libraries reported 92 database titles and 180 copies, averaging four each. Forty-five libraries reported 82 spreadsheet titles and 207 copies, averaging five each. Finally, 28 libraries reported 552 titles of "other" software for IBM, averaging 20 titles each and 238 copies, averaging 10 each.

Other--Printers and Modems

Printers and modems for library patrons seemed to be of limited availability. For staff members, such peripherals were more readily available. Laser printers were more limited for staff and rarely reported for library patrons. The survey did not specifically inquire about inkjet printers and many libraries had these available at CD-ROM stations and online terminals.

Dot Matrix Printers

Sixty-four libraries reported 314 dot matrix printers for patrons, averaging five each. Eighty-nine libraries reported 631 dot matrix printers for staff, averaging seven for each library. Thirty libraries reported 182 dot matrix printers in computer laboratories, averaging six each.

Laser Printers

Nine libraries reported 14 laser printers for patrons, averaging 1.5 each. Forty libraries reported 93 laser printers for staff, averaging 2.3 each. Fifteen libraries reported 30 laser printers in computer laboratories, averaging two each.

Modems

Eighteen libraries reported 33 modems for patrons, averaging 1.8 each. Eighty-one libraries reported 248 modems for staff, averaging three each. Five libraries reported 27 modems for computer laboratories, averaging 5.4 each.

Problems Experienced by Sample Libraries and Strategies Utilized to Cope with Them

Five problem areas and eleven coping strategies were presented on the survey form. Respondents were asked to prioritize these on a grid, relating each problem and strategy to the seven areas of computer applications which they had previously described. The

number of respondents who participated in part of the survey varied from category to category and ranged from 80% to 14%. Participation depended upon the involvement of that particular library in that particular computer application, and, upon the respondents desire to participate in this phase of the survey. Many respondents also did not rank every item. This tended to cause the items with greater participation to receive a higher ranking, a characteristic which seemed quite appropriate. The rank given each item is an average computed from the responses made for that item. If a respondent merely checked applicable problems and strategies, rather than prioritizing them, an "average" priority was given each response, i.e., three check marks were considered use of priorities 1,2, and 3, or a total of six points, divided by three, or an average of two. A ranking of two was then given to each of the three items.

Computer-based Services

This application received the largest number of responses, ranging from 40% to 80%. Ninety-eight percent of the libraries were utilizing a computer-based service. The table below summarizes the resonses, showing a very high ranking for "financial" as a problem with less sharply delineated rankings for coping strategies.

RANKINGS FOR COMPUTER-BASED SERVICES

Problems

Area	Rank	Responses
Financial	1.58	80
Staff	2.77	66
Facilities	3.30	59
Patrons	3.64	51
Vendor	3.73	53

Coping Strategies

Workshops	3.76	60
Shifted Budget	3.82	58
Vendor Training	3.91	56
Added Budget	4.05	55
Networking	4.54	48
Documentation	4.67	53
Cooperation	5.22	44
Journals	5.67	49
Added Staff	6.69	43
Patron Training	6.87	40
Consultants	7.63	41

Mainframe/Minicomputer Applications

Less than 50% of the respondents were involved in automated systems operating on local or shared mainframe or minicomputers. The reponses ranged from 40% to 24%. Again, there was a high ranking of "financial" as a problem. There was a relatively high ranking of "vendor training" and "networking" as coping strategies. Although the third and fourth ranked strategies dealt with the budget, there seemed to be a limited relationship between the top problems and top coping strategies. The response data is presented below.

RANKINGS FOR MAINFRAME/MINICOMPUTER APPLICATIONS

Problems

Area	Rank	Responses
Financial	1.52	40
Facilities	2.77	36
Staff	2.91	37
Vendor	3.0	31
Patrons	3.72	29

Coping Strategies

Vendor Training	2.96	33
Networking	3.5	24
Added Budget	4.06	30
Shifted Budget	4.53	28
Workshops	4.63	30
Cooperation	4.70	24
Patron Training	5.76	25
Consultants	5.90	22
Documentation	5.92	27
Added Staff	6.47	21
Journals	6.83	24

PC Applications--Databases

As reported earlier, the use of personal computers in this manner was very limited with applications of four and eight, respectively, in cataloging and circulation. Fourteen made applications in the serials areas, and 39 in acquisitions. Responses to problem and strategy ranking ranged from 34 to 18. Financial and staff areas ranked high as problems, and documentation, workshops and shifted budget were the three top ranking coping strategies. The responses are summarized in the following table.

RANKINGS FOR PC APPLICATIONS--DATABASES

Problems

Area	Rank	Responses
Financial	1.97	34
Staff	2.51	33
Facilities	3.13	29
Vendor	3.76	25
Patrons	3.86	23

Coping Strategies

Documentation	3.44	27
Workshops	3.51	29
Shifted Budget	3.96	27
Journals	4.21	28
Networking	4.88	26
Added Budget	4.95	21
Vendor Training	5.66	24
Cooperation	5.7	20
Added Staff	5.85	20
Patron Training	6.40	22
Consultants	7.16	18

PC Applications--CD ROM

Eighty-eight libraries reported CD ROM applications, many with multiple work stations. The problem/strategy response ranged from 71 to 33. Clearly the top problem ranking was "financial". The two leading strategies were "shifted budget" and "patron training."

RANKINGS FOR PC APPLICATIONS--CD ROM

Problems

Area	Rank	Responses
Financial	1.38	71
Facilities	2.98	55
Patrons	3.37	51
Staff	3.43	53
Vendor	3.70	51

Coping Strategies

Shifted Budget	2.98	55
Patron Training	3.56	48
Added Budget	3.93	46
Documentation	4.09	44
Workshops	4.62	51
Networking	5.08	46
Vendor Training	5.25	39
Cooperation	5.97	34
Journals	6.74	43
Added Staff	7.25	35
Consultants	7.60	33

PC Applications--Administrative

The greatest application of personal computers to administrative functions was in the area of word processing, reported by 86 libraries. The problem/strategy response rate ranged from 58 to 32. The highest ranked problems were "financial" and "staff," with correspondingly highest strategies being "shifted budget" and "documentation."

RANKINGS FOR PC APPLICATIONS--ADMINISTRATIVE

Problems

Area	Rank	Responses
Financial	1.89	58
Staff	2.39	51
Facilities	2.86	50
Vendor	3.85	41
Patrons	4.31	32

Coping Strategies

Shifted Budget	3.56	46
Documentation	3.58	39
Workshops	3.80	47
Networking	4.07	41
Journals	4.81	38
Added Budget	5.59	32
Cooperation	6.29	31
Vendor Training	6.47	34
Added Staff	7.19	31
Consultants	7.21	32
Patron Training	8.03	32

PC Applications--Patron Laboratories

Patron computer laboratories were reported by 55 of the libraries. However, for many of them the library staff did not have administrative responsibility. Most of them had some library staff involvement. The problem/strategy response rate ranged from 32 to 14. A table follows.

RANKINGS FOR PATRON LABORATORIES

Area	Rank	Responses
Problems		
Financial	2.34	29
Patrons	2.39	23
Facilities	2.40	32
Staff	2.68	29
Vendor	4.4	20
Coping Strategies		
Patron Training	3.28	21
Networking	4.19	21
Cooperation	4.27	18
Added Budget	4.45	22
Workshops	4.57	21
Shifted Budget	4.80	21
Documentation	4.83	18
Journals	5.40	22
Added Staff	5.4	15
Consultants	7.13	15
Vendor Training	7.42	14

Software Collections

Sixty was the largest number of libraries to report a group of software holdings. Forty-one was the largest number of respondents to rank a problem related to software. Without exception, this final application also has the "financial" problem ranked the highest. As far as strategies, "journals" and "shifted budget" ranked the highest.

RANKINGS FOR SOFTWARE COLLECTIONS

Problems

Area	Rank	Responses
Financial	1.65	41
Staff	3.09	32
Facilities	3.17	29
Vendor	3.59	27
Patrons	3.7	27

Coping Strategies

Journals	3.41	29
Shifted Budget	3.46	32
Added Budget	4.30	26
Workshops	4.62	29
Networking	4.70	27
Documentation	4.87	24
Cooperation	5.61	21
Vendor Training	5.75	24
Patron Training	5.86	22
Consultants	7.60	23
Added Staff	8.09	21

The Most Significant Helpful Strategy

Respondents were asked to comment of the most significant helpful strategy in coping with computerization. Approximately sixty responses were received in this category. Some responses similar in meaning but not identical in vocabulary were combined. The number in parenthesis indicates how often the concept was mentioned by different respondents.

MOST SIGNIFICANT STRATEGIES
("Write-ins" by Respondents)

Cooperation; Networking; Talking to Others. . .	16
Added Staff (Qualified staff)	7
Training	7
Money; Added Budgets	4
Grants	3
Reading	3
Shifted Staff	2
Planning	2
Flexibility; Open mind	2
Humor	
Proper Perspective	
Introducing a little at a time	

Input/pressure from students/faculty
Dreaming
Persistence
Documentation
Staff Involvement
Patience
High Positive Profile
Prayer
Deep Breathing Exercises
Long walks
Strong Tea

Several people commented that there were no real problems and that computerization was a solution, not a problem.

Summary and Conclusions

Pre-Survey Data

There is a wide range of support institutions give their libraries. The first characteristic compared was that of collection size, which ranged from seventeen to slightly over three hundred. Most libraries (56%) have less than 100 books per student. Sixteen percent have less than 50. These figures seem rather modest, especially for institutions of small to moderate size. This survey indicates, however, that libraries are putting a lot of money into resources other than books and that characteristics such as volumes held and volumes per student will become increasingly less indicative of the quality of the library and its ability to provide needed information to its clientele.

Dollars per student also varied widely, ranging from $59 to $1,000. Over 60% of the libaries spent over $200 per student. This may be a better indicator of quality service than the number of volumes but it is still a very undiscriminating indicator.

Most of the libraries in the sample spent between 50%-60% of their budgets on salaries, with the average being 57.2%. That range might well be considered appropriate for most libraries.

Libraries in the sample expended more for periodicals than for books. That seems very significant to this researcher and is indicative of the increasing importance that the characteristic of recentness of origin has to the value of materials and information. Periodicals certainly relate favorably to this characteristic in relation to books. This is also a factor in the dramatic utilization of online database searching and, in the last two years, CD-ROM products. Much of the current utilization of CD-ROM deals with indexes to periodical and other recently produced

materials. It is important to note that periodicals as library materials and database searching as a process are very expensive.

One more characteristic identified was the expenditures for databases and cooperative activities. The range was extremely wide--$100-$141,518. Most libraries expended between $6,000 and $30,000, averaging $23,675.

In summary, it can be noted that expenditures for periodicals, databases and cooperative activities, and CD-ROM products are utilizing a significant portion of library budgets and must be considered an increasingly major part of the resources a viable library makes available to its clientele.

Data from Library Responses

Nearly all of the responding libraries (94) used a bibliographic utility (OCLC, except for three) and nearly all subscribed to an online database broker (86 accessed Dialog). Slightly less than one-half had online catalogs and circulation systems.

Over one-half of the participants began their utilization of a bibliographic utility during the 1975-1979 period. The peak years for gaining access to online databases was 1980-1984 with start-up activity still strong in 1985-1989. The large number of online catalog starts occurred during the 1985-1989 period with starts during the two years of 1990-1991 nearly equaling the starts during the previous five years.

Eighty-eight (all except 12) of the libraries had at least one CD-ROM workstation. Fifty-six had three. Seven had ten or more.

Fifty-five libraries (over one-half) had computer laboratories for patrons in the library, averaging 16 computers per laboratory. Of the 805 computers in the laboratories, 267 were on LANs.

Twelve libraries reported general software collections for the Apple IIe averaging 43 programs each. Few libaries reported any general software (apart from word processing, database, and spreadsheets) collections for the Apple IIgs or Macintosh machines. Twenty-eight libraries reported holdings of general software for the IBM, averaging 20 titles each.

Although dot matrix printers were fairly commonly available to library staff and, to a lesser extent, to patrons. While laser printers were relatively rarely available to patrons, most staff members had access to at least one or two.

Modems were also very limitedly available to patrons, whereas nearly all libraries had modems available to staff members.

Problems Areas

Very clearly, and in all application areas, the major problem identified and ranked the highest was "financial." Several librarians interviewed, both within and outside of the sample, commented that they did not experience many problems with computer applications because, due to a lack of financial resources, they were not able to make very many, if any, computer applications. "Staff" and "facility" ranked closely together, about one point below "financial," and "patrons" and "vendor" were identified as being the least problematical. The table below shows the specific rankings.

OVERALL RANKING OF PROBLEM AREAS

Financial	1.76
Staff	2.82
Facility	2.94
Patrons	3.57
Vendor	3.72

Coping Strategies

Understandably, with the highest ranked problem being "financial," the highest ranked coping strategy was "shifted budget." Although the strategies were not as clearly ranked as the problems, there was a certain stratification. "Workshops" and "networking" were the next highest ranked strategies. This relates to the responses regarding the most significant strategy. Networking and talking to others received the most frequent mention. Clearly the lowest ranked strategy was that of "consultants."

OVERALL RANKING OF COPING STRATEGIES

Shifted Budget	3.87
Workshops	4.22
Networking	4.42
Added Budget	4.48
Documentation	4.49
Journals	5.29
Vendor Training	5.35
Cooperation	5.39
Patron Training	5.68
Added Staff	6.71
Consultants	7.18

Overall Conclusions

The following statements are offered as summary statements or conclusions based upon the data gathered for this research project. Some are more clearly demonstrable than others. All are reasonable from the perception of the researcher.

SUMMARY STATEMENTS

1. Computer applications have made major inroads into the operations of virtually all small to medium-sized academic libraries.

   a. Although there are perhaps two percent of the libraries in this category that did not use a major computer-based service, nearly all academic libraries in this category utilized a bibliographic utility and had access to online database searching.

   b. Most academic libraries in this category also utilized one or more CD-ROM applications (chiefy for database indexes), and utilized word processing and database/spreadsheet programs on PCs for administrative purposes.

   c. Nearly one-half of the libraries had locally-based automated systems that provided online catalogs and automated circulation. The use of such system modules for acquisition and serials was much more limited. Applications in these latter areas were as prevalent on PCs as on fully automated systems.

   d. Approximately one-half of the libraries housed computer laboratories for patrons. Although there was some library staff involvement in the operation of most of the laboratories, less than 20% indicated full library staff management.

2. The greatest problem associated with these applications was "financial."

   a. The reason given by those libraries not heavily involved in computer applications was generally financial.

   b. The most common coping strategy employed was that of "shifted budgets."

1.) Additional funds are frequently not viable options.

a.) The ranking of "added budget" fourth and "added staff" next to last as coping strategies are indications that computer applications are being funded by reducing support to other components.

b.) Another indication is that several respondents reported another frequently used strategy (not included on the response form) was shifted staff.

2.) Financing by shifting funds changes the normal acquisition patterns of the library and reduces the resources available in more traditional areas such as books, while adding available resources in other areas such as databases.

a.) These characteristics require an adjustment in the acquisition and collection development practices of faculty and library staff members.

b.) These characteristics require an adjustment in the research skills and practices of library staff and patrons.

c.) These characteristics require an adjustment by librarians and administrators in budgeting and library funding.

3. There is an increasing importance given to the "recentness" of materials and information which is evidenced by increased expenditures for periodicals, for access to online databases, and for CD-ROM programs, which currently are chiefly indexes to databases.

a. This importance is likely to continue and increase; these trends have not peaked.

b. The relationship among these trends and technologies may foster variant developments such as the following:

1.) Increased use of CD-ROM access to databases and a decreasing utilization of more expensive online services.

2.) Increased networking of CD-ROM workstations.

3.) Incorporation of database indexes into local online, automated systems and a reduction in utilization of CD-ROM for indexing--at least for selected, major databases.

4. Communication and relationships among people involved with computer applications and libraries is a prime factor.

   a. Workshops, qualified staff, cooperative activities, assistance from computer center staffs, etc. were all important coping strategies identified by respondents. Although computer applications can handle some of the tasks done by people, they heighten and amplify the need for interpersonal relationships.

   b. Consultants ranked very low as a coping strategy. Perhaps the interpersonal relationships most helpful are perceived to be those of a more colleagial and informal nature. Perhaps consultants were not perceived as being cost effective.

5. Librarians seem to be of a mind set that demonstrates a willingness and desire to incorporate and utilize whatever technology and resources are necessary, even with limited resources, and make whatever adjustments and changes are necessary to provide the resources needed by their patrons.

gwo
August, 1991

COMPUTERS AND LIBRARIES

A Survey of Applications Implemented and Staff Coping Strategies Employed

This is a survey of approximately 150 college libraries holding between 90,000 and 500,000 volumes. It is undertaken as a sabbatical research project, chiefly to examine how administrators and staff members are coping with changes associated with computerization. Findings will be shared with participants and with the library community. Respondents will not be identified without their expressed permission. It will take about 20 minutes to complete this form. **PLEASE RETURN THE SURVEY IN THE ENCLOSED, STAMPED ENVELOPE BY APRIL 23,1991 OR WITHIN FIVE DAYS OF RECEIPT. THANK YOU.**

I. What computerized applications have been implemented in your library?

Note: This question is divided into sections dealing with outside computer services, local or shared mainframe / minicomputers, and various PC applications.

Year Begun | Year Ended | (Application presumed ongoing if no year ended is shown; if year is estimated, ( ) please enclose in parenthesis.)

A. Computer-based Services (Fee for outside computer services)

____ ____ 1. Bibliographic Retrieval (cataloging, online)
__OCLC __WLN _ RLIN _ Other:_____ _____
No. of Workstations: _____

____ ____ 2. Database Searching (online)
_Dialog _BRS _Wilsonline
_Lexis _Nexus _Westlaw __Other:_____
No. of Workstations: _____

____ __ __ 3. Acquisitions - Vendor: _____
No. of Workstations: _____

__ __ ____ 4. Serials Control - Vendor:_____
No. of Workstations: _____

__ __ ____ 5. COM Catalog - Vendor: _____
No. of Workstations for Production: _____
No. of Public Access Stations: _____

____ __ __ 6. CD-ROM Catalog - Vendor: _____
No. of Workstations for Production: _____
No. of Public Access Stations: _____

__ __ ____ 7. Other: _____

B. Mainframe/Minicomputer Applications (Local and Shared)

____ ____ 1. Online Catalog - Vendor: _____
Hardware: _____
Type of Terminal: _____
No. of Terminals: Staff ___ Public ___

____ ____ 3. Circulation - Vendor: _____
Hardware: _____
Type of Terminal: _____
No. of Terminals: Staff ___ Public ___

__ __ ____ 4. Acquisitions - Vendor: _____
Hardware: _____
Type of Terminal: _____ _____
No. of Terminals: Staff ___ Public ___

Year Begun | Year Ended

__ __ | ____ 5. Serials - Vendor: _____
Hardware: _____
Type of Terminal: _____
No. of Terminals: Staff ___ Public ____

____ | ____ 6. Other: _____
Hardware: _____
Type of Terminal: _____
No. of Terminals: Staff ___ Public _____

C. PC Applications - Library Databases

__ __ | ____ 1. Catalog - Vendor: _____
Hardware: _____
No. of Workstations: Staff ____ Public ___

__ __ | ____ 2. Circulation - Vendor: _____
Hardware: _____
No. of Workstations: Staff ____ Public ___

____ | ____ 3. Acquisitions - Vendor: _____
Hardware: _____
No. of Workstations: Staff ____ Public ___

____ | ____ 4. Serials - Vendor: _____
Hardware: _____
No. of Workstations: Staff _____ Public ___

____ | ____ 5. Other: _____
Hardware: _____
No. of Workstations: Staff _____ Public ___

Comments:

D. PC Applications - CD-ROM

__ __ | _____ 1. Database: _____
Hardware: _____
No. of Workstations: _____ Networked? __

__ __ | ____ 2. Database: _____
Hardware: _____
No. of Workstations: _____ Networked? __

__ __ | ____ 3. Database: _____
Hardware: _____
No. of Workstations: _____ Networked? __

____ | ____ 4. Database: _____
Hardware: _____
No. of Workstations: _____ Networked? __

__ __ | ____ 5. Database: _____
Hardware: _____
No. of Workstations: _____ Networked? __

Please list additional CD-ROM databases (and their configuration) which you have available below or on a separate sheet.

Year Begun | Year Ended

E. PC Applications - Library Administrative Functions

____ ____ 1. WordProcessing Software: _____
Hardware: _____
No. of Workstations: ____

____ ____ 2. Spreadsheet - Software: _____
Hardware: _____
No. of Workstations: ____

____ ____ 3. Database - Software: _____
Hardware: _____
No. of Workstations: ____

____ ____ 4. Other: _____
Hardware: _____
No. of Workstations: ____

F. PC Applications - Patron Laboratories (located in the Library although not necessarily managed by the library or dealing with library programs or materials.

____ ____ 1. Apple IIe: Total No. ____ No. of Total on LAN: ____
Library Management Role: _____

____ ____ 2. Apple IIgs: Total No. ____ No. of Total on LAN: ____
Library Management Role: _____

____ ____ 3. Macintosh 512+, SE, Classic, LC: Total No. ____No. of Total on LAN: ____
Library Management Role: _____

____ ____ 4. Macintosh II series: Total No.: ____ No. of Total on LAN: ____
Library Management Role: _____

____ ____ 5. IBM & Compatibles: Total No. ____ No. of Total on LAN: ____
Library Management Role: _____

____ ____ 6. Other: _____
_____
_____

G. Software Collections - Please indicate the number of titles and copies held by the library in each category. Include the total number covered by a site license if appropriate.

HARDWARE	SOFTWARE							
	Word Processing		Database		Spreadsheet		Other	
	Titles	Copies	Titles	Copies	Titles	Copies	Titles	Copies
Apple IIe								
Apple IIgs								
Macintosh 512, SE, etc.								
Macintosh II series								
IBM & Compatibles								
Other:								

Comments:

H. Other - Please indicate number of printers available for each type of patron.

1. No. of Dot Matrix Printers:
   Library Patrons: _____ Library Staff: _____ Computer Lab(Section F) Patrons: _____
2. No. of Laser Printers:
   Library Patrons: _____ Library Staff: _____ Computer Lab(Section F) Patrons: _____
3. No. of Modems:
   Library Patrons: _____ Library Staff: _____ Computer Lab (Section F) Patrons: _____

   What is accessed by modems/comments:

4. Other:

II. What Problems Have Been Brought About By Computer Applications and How Have You and Your Staff Coped With Them?

You are asked to relate potential problems and coping strategies to the applications you described in part I in the grid on the next page. The following definitions are offered to clarify this process.

Problems

1. Financial - Budgetary problems caused by the expense of introducing or maintaining computer applications.
2. Facilities - The unsuitability of existing buildings to handle or be modified for computer applications.
3. Staff - Inadequate staff size or inability of staff to adapt skills or attitude.
4. Patrons - Users unable or unwilling to make adaptations necessary for computer applications.
5. Vendor - Suppliers performing poorly or failing to deliver satisfactory equipment and services.

Coping Strategies

1. Workshops, Courses - Structured educational opportunities to develop knowledge, skill, etc.
2. Journal Reading - Informal studies to maintain and develop competencies in the area.
3. Vendor Training - Workshops, documentation, etc. to enable staff to handle specific applications.
4. Consultants - Utilization of paid experts to assist in decision making and implementation.
5. Networking - Informal consultation with colleagues and peers to help in decision making & implementation.
6. Cooperation - Engaging in joint projects with other libraries to facilitate computer applications.
7. Documentation - Careful record keeping and logging to enable staff to facilitate and implement.
8. Added Staff - New staff members with skills and attitudes well-suited to the required tasks.
9. Patron Training - Instruction for users.
10. Added Budget - Increased allotments; new money.
11. Shifted Budget - Decreased some; added to others.

Directions: Please rank each of the problem areas (1-5) and each of the coping strategies (1-11) with 1 being most significant. If an unidentified factor was significant, include "other" in the ranking and describe/comment.

Applications	Problems					Coping Strategies										
	Financial	Facilities	Staff	Patrons	Vendor	Workshops	Journals	Vendor Training	Consultants	Networking	Cooperation	Documentation	Added Staff	Patron Training	Added Budget	Shifted Budget
A. Computer-Based Services																
B. Main/Mini Applications																
C. PCs - Databases																
D. PCs - CD-ROM																
E. PCs - Administrative																
F. PCs - Patron Labs																
G. Software Collections																
H. Other																

(Please detail "other" problems or strategies and share additional comments on the reverse side.)

What have you found to be the most significant helpful strategy in coping with computerization?

Thank you very much for your participation. Your replies will be helpful as we in the profession continue to work with computer applications in libraries.

Glenn Offermann, Librarian
Concordia College, St. Paul

Name _____ Title _____

Library _____ Date _____